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December 21, 1998

VIA HAND DELIVERY

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Magalie Roman Salas, Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, DC 20554

Re: Ex Parte Presentation
ET 95-18/RM 9328

Dear Ms. Salas:

Pursuant to Section 1.1206 of the Commission's rules, I hereby submit an original plus three copies of this letter to notify you that Dave Otten of Celsat America, Inc. and I met on Thursday, December 17, 1998 with Rebecca Dorch, Charles Iseman, Geri Matise, Fred Thomas and Sean White of the Office of Engineering and Technology ("OET"). During this meeting, Celsat provided background information about the company and its application at the Commission to provide mobile-satellite service ("MSS") at 2 GHz. Celsat also explained the technical details behind the ability of its 2 GHz MSS system to share spectrum with broadcast auxiliary service licensees in the 2 GHz band. In this regard, Mr. Otten distributed copies of the attached documents to the individuals present at the meeting.

In addition to the aforementioned meeting with the OET staff, Dave Otten met separately with Thomas Tycz and Karl Kensinger of the Commission's International Bureau. At this meeting, Mr. Otten discussed the feasibility of adopting certain band plans for 2 GHz, including the possibility of dividing the 2 GHz band into regional and global segments.

Please direct any questions concerning this matter to the undersigned.

Very truly yours,

Brian D. Weimer

Enclosures

cc: Rebecca Dorch
Charles Iseman
Karl Kensinger
Geri Matise
Fred Thomas
Thomas Tycz
Sean White

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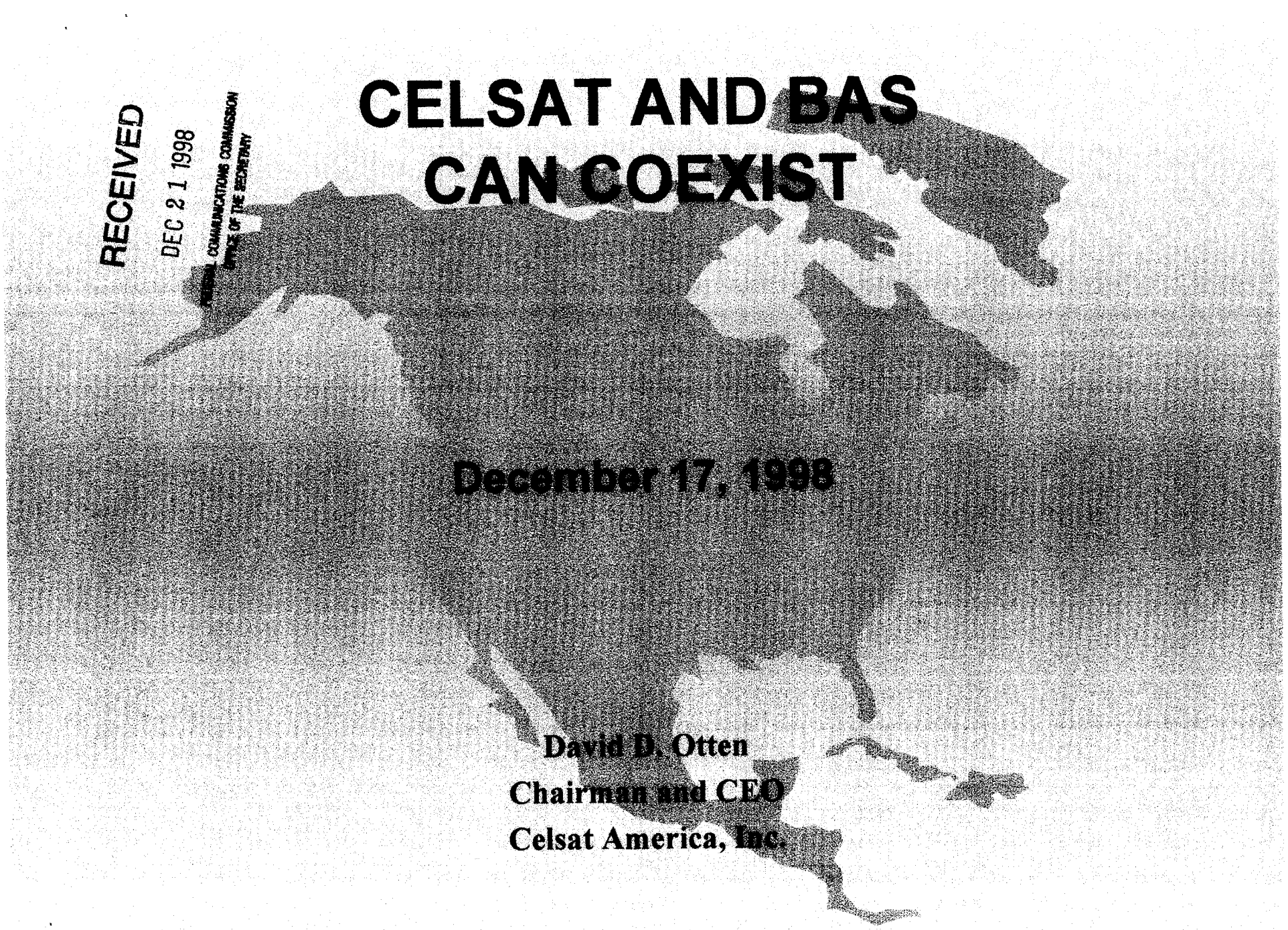
CELSAT AND BAS CAN COEXIST



December 17, 1998

David B. Otten
Chairman and CEO
Celsat America, Inc.

SOME FUNDAMENTALS

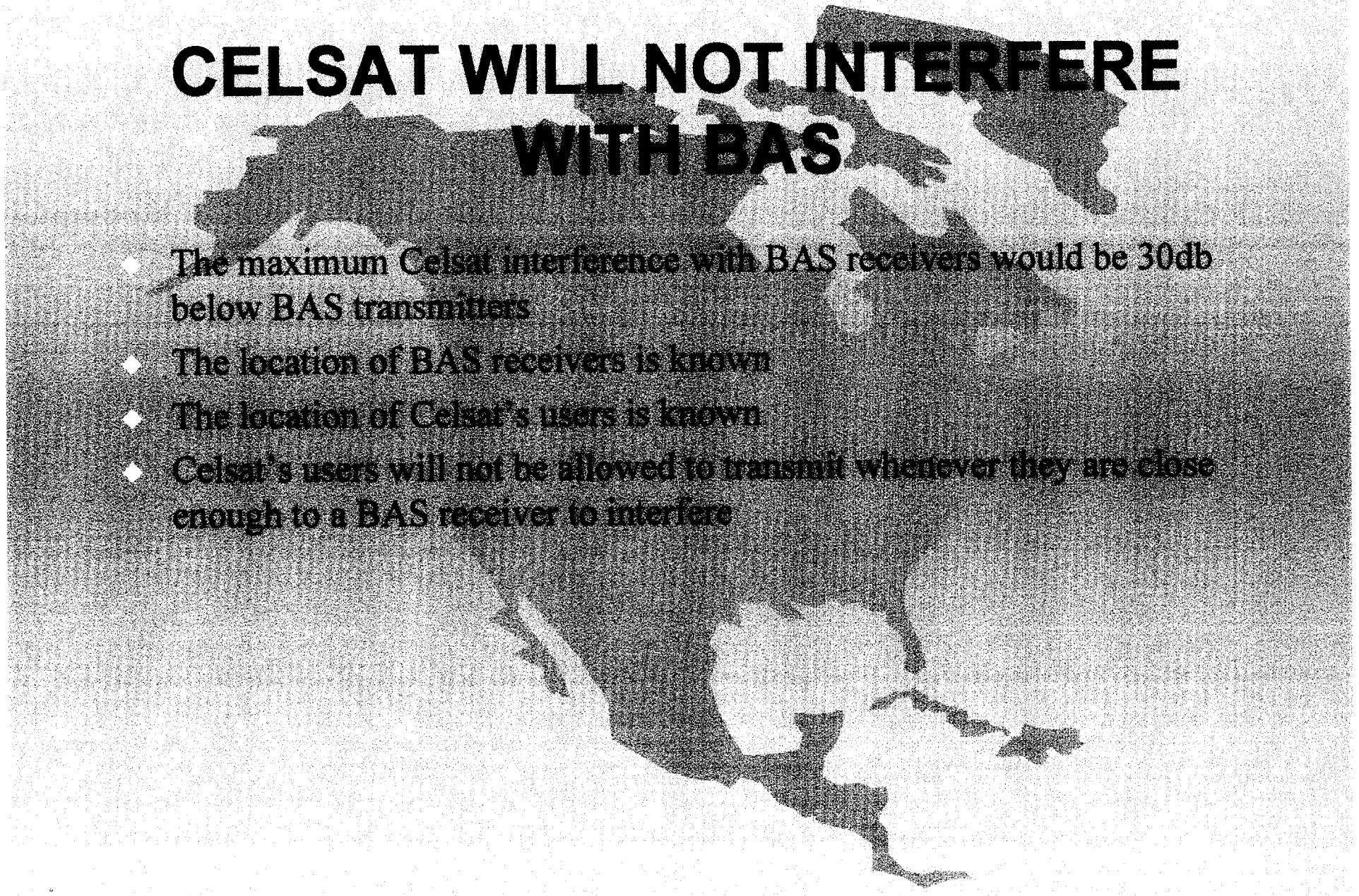
- Celsat has very small beams, greatly reducing any problems that LEO's or MEO's would have with BAS
- Celsat will be responsible if there is any interference with BAS
- Celsat subscribers will have dual mode handsets
  - In the cities (where BAS primarily operates) Celsat subscribers will operate through our partner's ground towers and hence operate in a different band

BAS WILL NOT INTERFERE WITH CELSAT

- Celsat's GEO satellites are always 30 degrees above the horizon
- BAS operates horizontally, therefore will not illuminate a Celsat satellite through the main lobe, but through a sidelobe with a gain less than 0db
- BAS radiates 12 watts over 17 MHz of bandwidth
- Celsat users radiate 2 watts over 50KHz of bandwidth
- Thus, in the worst case of peak BAS radiation, BAS is 17db below a Celsat user. Operating Celsat near band edges, BAS radiation would be 27dbor more below a Celsat user. 10db below Celsat would be acceptable.
- Diversity from the second Celsat satellite would further minimize any problem
- Ground processing exploiting redundancy in video signals could be used in the very unlikely event that it proves necessary

CELSAT WILL NOT INTERFERE WITH BAS

- The maximum Celsat interference with BAS receivers would be 30db below BAS transmitters
- The location of BAS receivers is known
- The location of Celsat's users is known
- Celsat's users will not be allowed to transmit whenever they are close enough to a BAS receiver to interfere



BAS-ENG

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COMPATIBILITY BETWEEN CELSAT'S PROPOSED SATELLITE/MOBILE COMMUNICATIONS SERVICE AND THE BROADCAST AUXILIARY SERVICE

1. INTRODUCTION

1.1 CELSAT

CELSAT proposes a dual-mode satellite/terrestrial mobile communications service in which a large number of mobile phones receive service from either terrestrial base stations or one or more geostationary satellites. The satellites will be sufficiently powerful, being equipped with large antennas, to support communication with small, cellular-like handheld phones with simple stub antennas. The phones are expected to receive service from terrestrial/cellular-type base stations where available, and only load the satellite when no terrestrial service is available, thus allowing a large number of dual-mode subscribers to exist without overloading the limited satellite capacity.

1.2 Broadcast Auxiliary Service

The Broadcast Auxiliary Service (BAS) is allocated seven frequency bands of about 17MHz bandwidth for use by TV Outside Broadcast Vehicles - more commonly known now as Electronic News Gathering or ENG. TV pictures are transmitted from mobile ENG units to fixed receiving sites using wideband, analog-FM video modulation. The first of the seven BAS-ENG frequency bands is that which has been proposed to be allocated for satellite-mobile communications. It is the mobile-to-satellite (uplink) direction that is proposed to operate in this frequency band.

Some satellite systems consider that they cannot operate while BAS-ENG transmissions remain in that frequency band, and expect BAS-ENG to be restricted to operate in the remaining six bands. On the face of it, this should not be a major problem for BAS-ENG, as all the BAS-ENG equipments are today programmble in frequency. It is necessary for them to be programmable because they are mobile units, and ad hoc frequency assignment is used to avoid interference between different users, in dependence on their relative locations or proximity. Reallocating band I to satellite communications would therefore, on sim[ple considerations, seem to have no more impact than a reduction of 1/7th or 14% in the total number of BAS-ENG units that could operate in a given area. It is the purpose of this paper to consider if CELSAT necessarily requires that BAS-ENG services be restricted from using band I, or whether CELSAT's particular concept of a dual-mode system could be compatible with continued use of band I by BAS-ENG services.

2. POTENTIAL INTERFERENCE

Because the BAS-ENG band I is the proposed satellite uplink, there will be no interference to BAS-ENG from the satellite-to-earth transmissions. The potential interference to BAS-ENG arises from transmissions to the satellite from handheld phones in the vicinity of BAS-ENG receivers.

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The BAS-ENG bands are used in a variety of ways including transmission links from Outside Broadcast Vehicles to fixed stations using directional antennas at both ends; transmission from man-portable cameras to relatively nearby receiving vehicles or helicopters for onward transmission using the first type of link; transmission from cameras mounted on race cars, for example, to receivers in helicopters, for example, where the race-car borne transmitter uses realtively low power (1 watt) and an omnidirectional antenna, and wireless transmission from cameras in concert halls, for example, to receiving antennas on the ceiling, for example, using perhaps 100mW of RF power for the very short ranges involved.

It is difficult to analyse all of these possible interference scenarios, but a simplifying proposition would be to restrict the use of the BAS-ENG band I to links of the first type, that is for relatively long range transmissions from Outside Broadcast Vehicles using directional antennas to fixed receiving sites. Such a restriction would not be expected to impact total BAS-ENG capacity.

3.1 AVOIDANCE OF INTERFERENCE TO FIXED BAS-ENG STATIONS

The BAS-ENG transmitter radiates 12 watts using a +22dBI parabola, that is an EIRP of +33dBW. The CELSAT handportables on the other hand are limited to 2 watts peak, into a +3dBI antenna at best, more typically 0dBI when polarization mismatch is taken into account. The maximum interfering EIRP is thus +3dBW, 30dB below the BAS-ENG transmitters.

Moreover, CELSAT includes margin in the uplink budget for at least 4dB loss of radiation efficiency when holding the handportable to the ear. This loss of efficiency, if encountered, reduces the interference likewise; if the loss is not encountered, a power control loop reduces the radiated power commensurately. Thus the EIRP ratio to BAS-ENG is at least -34dB.

The propagation of the BAS-ENG signal is essentially free space, obtained by elevating the transmit antenna as necessary to obtain a clear shot to the receiving tower. CELSAT handportables are operated at ground level however, and the typical cellular propagation law to a fixed base station will apply, being approximately a 4th power law.

Further protection may be obtained by allocating on a shared basis, portions of the BAS-ENG band I to CELSAT such that CELSAT's signals lie on the edges of the BAS-ENG band. Continued work at CELSAT has defined an optimum communications waveform which is narrowband (50KHz) on the uplink and of medium bandwidth (200KHz) on the downlink. CELSAT's per-cell (per-beam) capacity of nominally 500 simultaneous conversations may be obtained using the upper 2.5MHz and the lower 2.5MHz of the BAS-ENG band I. The BAS-ENG video signal is much less sensitive to such offset interference as it produces interference frequencies in the video baseband corresponding to a picture resolution beyond the TV receiver's reproduction capability. Moreover, the BAS-ENG receiver filter has increasing attenuation towards the band edges

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in order to obtain adjacent channel protection. It is estimated that the signal-to-interference ratio tolerable without noticeable picture degradation can be 10dB when the above precautions are taken.

TO CONFIRM { Figure 1 shows the signal-to-interference ratio as a function of the distance ratio, using the above assumptions. It is seen that the interference level reaches the 10dB S/I criterion only when a handportable is X times nearer the BAS-ENG receiving site than the BAS-ENG transmitter.

CELSAT will adopt a self-imposed exclusion zone to avoid handportables transmitting to the satellite when they are closer to a BAS-ENG receiver using band I than the threshold amount. This will only reduce the service area for CELSAT by the amount $1/X^2$, or Y %, which will have little impact.

The exclusion zone can be guaranteed by a number of technical ways that are discussed in para. 4. The impact on CELSAT is further reduced when it is considered that CELSAT portables do not need to transmit to the satellite when they are within terrestrial base station coverage, and such coverage is likely to exist in the urban areas of high population density where the BAS-ENG services are also likely to be most active.

3.2 INTERFERENCE FROM BAS-ENG TRANSMITTERS TO CELSAT

The BAS-ENG transmitters operate on the CELSAT uplink frequency, and thus do not interefere with CELSAT handportables. They potentially interfere with reception of handportable signals at the CELSAT satellite receiver.

However, the CELSAT satellites are seen over most of the USA at elevation angles of typically 30 degrees, whereas the BAS-ENG outside broadcast vehicles transmit substantially horizontally using directional antennas, i.e. at 0 degrees elevation, to the receiving towers. The CELSAT satellites will therefore only receive interference via the far-sidelobes of the BS-ENG transmit antenna, where the gain has fallen to around 0dBI. The interfering EIRP with which CELSAT has to contend is thus 12 watts, or +11dBW.

CELSAT's uplink bandwidth of 50KHz is however 340 times less than the 17MHz BAS-ENG band, thus the spectral density of the BAS-ENG signal per 50KHz bandwidth is reduced by at least 340, or 25.5dB, to an amount per CELSAT channel of -14.5dBW, which is 17dB below the +3dBW (PEAK) of a CELSAT portable phone. Moreover, the BAS-ENG signal spectrum would be expected to exhibit at least 10dB roll-off at the band edges, where it is proposed that CELSAT allocations could be made on a shared basis.
Thus the signal-to-interference ratio for CELSAT is estimated to be 27dB, and CELSAT can operate down to 10dB or less without impact.

CELSAT considers therefore that reasonable levels of interference from directional BAS-ENG transmitting antennas could be tolerated with good margin

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CELSAT is also developing unique technological concepts for combatting such interference, should it be greater than anticipated, using ground processing that exploits redundancy in the video signal and/or using two-satellite diversity reception.

4. MEANS TO GUARANTEE AN INTERFERENCE-FREE EXCLUSION ZONE

CELSAT can adopt measures to guarantee that a CELSAT handportable does not transmit in the BAS-ENG band when too close to a fixed BAS-ENG receiving site

One such measure is for CELSAT to provide, for each BAS-ENG fixed site, a beacon transmitter that will transmit a signal on CELSAT's downlink band that is normally monitored by CELSAT handportables. If the signal is received by a handportable above a certain threshold level, it signifies that a path exists to the BAS-ENG site which would potentially be interfering, and the handportable is then inhibited from transmitting on the BAS-ENG frequency. It is not however inhibited from transmitting on a cellular or PCS frequency band and can thus continue to receive service if a terrestrial network is present.

As a refinement, CELSAT can provide a terrestrial site of limited capacity at the BAS-ENG receiving site, and having a range at least equal to the maximum interfering radius, if no other operator has provided terrestrial service there, thus ensuring that CELSAT portables will always receive service.

CELSAT's filing with the FCC includes description of a dual-mode satellite/terrestrial network with characteristics compatible with the above method. CELSAT plans also to deploy terrestrial repeaters to enhance the satellite signal and provide enhanced capacity in areas of high activity. Such repeaters can take the form of "microcells", which serve limited areas such as shopping malls using very low power. When a CELSAT portable is within the service area of such a microcell, the CELSAT power control system causes the portable units to reduce power down to only that level necessary to maintain communications, typically 20dB below the maximum level of 2 watts peak used for communicating with the satellite. Such microcells can thus be deployed to maintain service to CELSAT portables while allowing them to substantially reduce their power levels, and thus operate closer to the BAS-ENG sites without mutual interference.